

REMARKS

This invention is directed to a field emitter source and a method of processing same. Claims 1, 4-8, 12-16, 18 and 21-36 are pending in the application.

I. THE 112, 2nd PARAGRAPH REJECTION

Claims 4-8, 12-16 and 21-22 are rejected under 35 U.S.C. §112, second paragraph for allegedly being indefinite. The Office Action states that claims 4-8 and 12-16 lack antecedent basis for the limitation of "The invention of claim." Applicants have amended claims to recite the limitation recommended by the Office Action of "The composition of claim." Claims 21-22 have been amended to recite the suggested limitation of "The method of claim."

II. THE ANTICIPATION REJECTIONS**A. Traverse of the Anticipation Rejection of Claims 1, 4-8, and 12-16**

Claims 1, 4-8, and 12-16 are rejected under 35 U.S.C. §112, second paragraph for allegedly being anticipated by Tuck *et al.* (WO 02/03413). The Office Action states that Tuck *et al.* teach a field emission device that is anticipatory to the present invention.

Applicants respectfully disagree. Claim 1 has been amended to clarify that the silica and the carbon black are added to the mixing medium, and that the mixing medium has a viscosity of less than approximately 1500 cps. Support for the amendments can be found in the original specification, for example at paragraph 28 and 39. Accordingly, claim 5 has been canceled. The Tuck *et al.* reference does not teach a viscosity of the mixing medium. The applicants have discussed the importance of the viscosity with respect to the consistency of the field emission properties (paragraph 28).

As is well settled, in order to establish anticipation under 35 U.S.C. § 102(b) a prior art reference must disclose each and every limitation either expressly or inherently in a single prior art reference. See, *Celeritas Techs. Ltd. v. Rockwell Int'l Corp.*, 150 F. 3d 1354, 1360 (Fed. Cir. 1998); *Standard Havens Prods., Inc. v. Gencor Indus. Inc.*, 953 F.2d 1360, 1369 (Fed. Cir. 1991); *Jamesbury Corp. v. Litton Indus. Products*, 756 F. 2d 1556 (Fed. Cir. 1985); *American Hospital Supply v. Travenol Labs.*, 745 F.2d 1 (Fed. Cir. 1984). There must be no difference between the claimed invention and the reference disclosure as viewed by one of ordinary skill in the art. See,

Scripps Clinic & Research Fdn. v. Genentech, 927 F.2d 1565, 1576 (Fed. Cir. 1991), *Carella v. Starlight Archery and Proline Co.*, 804 F.2d 135, 138 (Fed. Cir. 1986); *RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 1444 (Fed. Cir. 1984). In this case the Tuck *et al.* reference does not disclose the viscosity of the mixing medium. Furthermore, some of the compounds that Tuck *et al.* teaches as thickening agents fall outside of the claimed limitation. For at least these reasons, applicants respectfully request that the anticipation rejection of claims 1, 4-8, and 12-16 be withdrawn.

B. Traverse of the Anticipation Rejection of Claims 1, 4-6, 13 and 15

Claims 1, 4-6, 13 and 15 are rejected under 35 U.S.C. §112, second paragraph for allegedly being anticipated by Fuji *et al.* (US 5,547,609). The Office Action asserts that Fuji *et al.* teach the claimed composition. The Office Action states that the carbon black described by the prior art reference will have the same or substantially the same as the carbon black.

Applicants respectfully disagree. The Fuji *et al.* reference teaches an electroconductive resin composition. The Fuji *et al.* reference does not teach a field emitter composition. The Office Action asserts that the claimed composition and the Fuji *et al.* composition are substantially the same and that they would be expected to have identical properties. However, there exist significant differences between the Fuji *et al.* composition and the claimed invention. For example, the electro-conductive inorganic filler and a wax having a high softening point. An anticipation rejection may be proper even though a certain characteristic of the claimed invention is not explicitly disclosed in the cited reference so long as that characteristic is inherent within the cited reference. M.P.E.P. § 2131.01. However, "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic ... extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill in the art." M.P.E.P. § 2112. It is the examiner's duty to "provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Id.* No such basis in fact has been provided to show why the electroconductive composition of Fuji *et al.* would have the same properties as the claimed invention.

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CENTRAL FAX CENTER****OCT 19 2007****III. THE OBVIOUSNESS REJECTIONS****A. Traverse of the Obviousness Rejection of Claims 1, 4-8 and 12-16**

Claims 1, 4-8 and 12-16 are rejected under 35 U.S.C. §103(a) for allegedly being obvious over the Tuck *et al.* patent in view of Blanchet-Fincher *et al.* (US 5,948,465). The Office Action states that the prior art fails to teach the source of carbon black. The Office Action asserts that it would have been obvious to one of skill in the art to substitute the carbon black in the composition of Tuck with carbon black from other sources with reasonable expectation of success, because the carbonaceous electron emitters were well known in the art at the time of the invention as shown by the teachings of Blanchet-Fincher.

Applicant respectfully disagrees. For the reasons described above in the anticipation traverse, the Tuck *et al.* reference does not teach all of the elements of the claimed invention. In particular the Tuck *et al.* reference does not teach a viscosity of the mixing medium. The combined references, therefore, do not teach or suggest all of the elements of the claimed invention. For at least this reason the applicants respectfully request that the obviousness rejection of claims 1, 4-8 and 12-16 be withdrawn.

B. Traverse of the Obviousness Rejection of Claims 18 and 21-28

Claims 18 and 21-28 are rejected under 35 U.S.C. §103(a) for allegedly being obvious over the Tuck *et al.* patent in view of Blanchet-Fincher *et al.* (US 5,948,465). The Office Action states that Tuck fails to teach the measuring of the field emitter properties per claim 18. The Office Action relies on Blanchet-Fincher to teach measuring the field emitter properties as a function of applied voltage. The Office Action asserts that it would be obvious to measure the properties of the field emitter during the process of making the composition as routine quality control function of the process control to optimize the process steps as shown by Blanchet-Fincher.

Applicant respectfully disagrees. Claim 18 has been amended to include the limitations previously found in claims 23 and 24. As a result claims 23 and 24 are canceled without prejudice, and claims 25-28 are amended to depend on claim 18. The Blanchet-Fincher reference teaches the emission current being measured as a function of applied voltage. These measurements were done to test the emissivity of the different carbon emitters. The present invention teaches and claims

measuring the vertical resistance of the formulation to adjust the carbon black content. The Office Action asserts that one of skill in the art would find it obvious to measure the properties of the field emitter formulation because the Blanchet-Fincher reference is suggestive of the claimed process step. However, the Blanchet-Fincher reference is not suggestive of the process step because they do not measure vertical resistance or teach evaluating the formulation to see if the formulation has reached a particular desired conductivity threshold. Therefore, the Blanchet-Fincher reference does not cure the deficiencies of the Tuck *et al.* reference. Applicants respectfully request that the obviousness rejections of claims 18 and 21-28 be withdrawn.

C. Traverse of the Obviousness Rejection of Claim 36

Claim 36 is rejected under 35 U.S.C. §103(a) for allegedly being obvious over the Tuck *et al.* patent in view of Hattori *et al.* (US 5,599,749). The Office Action states that the prior art fails to teach the step of planarizing the cured field emitter composition layer by chemical mechanical polishing. The Office Action relies on Hattori *et al.* to teach planarizing cured active layer of a field emitter containing DLC by CMP and its benefits with improved adhesion bonding and mechanical strength of the electron emitting layer. The Office Action asserts that it would have been obvious to a person of skill in the art to planarize the active layer by CMP because the prior art is suggestive of the claimed process step.

Applicants respectfully disagree. However, to advance the prosecution of this application claim 36 is canceled without prejudice.

D. Traverse of the Obviousness Rejection of Claims 1, 4-8, 12-15, 18 and 22-28

Claims 1, 4-8, 12-15, 18 and 22-28 are rejected under 35 U.S.C. §103(a) for allegedly being obvious over the Ma *et al.* (2005/0224764) in view of Tuck and Blanchet-Fincher *et al.* The Office Action states that Ma *et al.* teach the composition of electroconductive ink. The Office Action further states that the Ma *et al.* reference fails to teach the addition of silica particles in the composition. The Office Action relies on the Tuck and Blanchet-Fincher *et al.* references to teach silica as rheology modifiers.

The applicants respectfully disagree. The Ma *et al.* reference teaches an electroconductive ink comprising carbon fibrils or nanotubes. In fact, in the Background section of the Ma *et al.*

reference they state “(c)ommercially available electroconductive inks which contain carbon black for example, cannot emit electrons and thus cannot be used in field emission devices.” Furthermore the Ma *et al.* reference states, “(f)ibrils are not a very efficient space filling material. A mat with a density of 0.3 cm³ has an 85% void volume. In order to fill the void space, certain samples had carbon black blended into the void space instead of additional polymeric binder. These formulations did not yield significant advantages or increases in performance over formulations with fibrils alone.” Because the Ma *et al.* reference teaches polymeric binders for changing the rheology of the inks one of skill in the art would not be motivated to silica as a rheological modifier. Additionally, the Ma *et al.* teaches away from using carbon black as the field emitter.


For subject matter defined by a claim to be considered obvious, the Office must demonstrate that the differences between the claimed subject matter and the prior art “are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a); see also *Graham v. John Deere Co.*, 383 U.S. 1, 148 U.S.P.Q. 459 (1966). A person of skill in the art would have had to select carbon black, and silica as the rheological modifier, against the teachings of the Ma *et al.* reference. For at least this reason, applicants respectfully request that the obviousness rejections of claims 1, 4-8, 12-15, 18 and 22-28 be withdrawn.

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CONCLUSION

The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned representative.

Respectfully submitted,

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